

RICHMOND, FREDERICKSBURG & POTOMAC RR UNDERPASS
(Mt. Vernon Memorial Highway Bridge No. 4)
RF&P Railroad, spanning George Washington Memorial Parkway
Arlington Vicinity
Arlington county
Virginia

HAER No. VA-90

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WRITTEN HISTORICAL AND DESCRIPTIVE DATA

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

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HISTORIC AMERICAN ENGINEERING RECORD

RICHMOND, FREDERICKSBERG, & POTOMAC RAILROAD UNDERPASS (Mount Vernon Memorial Highway Bridge No. 4) HAER No. VA-90

I. INTRODUCTION

Location: George Washington Memorial Parkway milepost 11.06, 0.1 miles from Fourteenth Street Bridge, carries R.F. & P. Railroad over GWMP in Arlington County, VA.

Date of Construction: 1930-1932.

FHWA Structure No. 3300-041P.

Type: Through-plate steel girder bridge.

Designer: Bureau of Public Roads (BPR).
Gilmore D. Clarke, Consulting Landscape Architect.
J.V. McNary, Senior Bridge Engineer, construction.
N.W. Morgan, Engineering Designer.

Contractor: Merritt-Chapman and Scott Corporation, New York.

Present Owner: National Capital Region, National Park Service.

Present Use: Southbound railroad traffic over the GWMP.

Significance: The R.F. & P. Railroad Underpass is one of the twelve original bridges in the MVMH project. This bridge remains the only direct rail link between Washington and the South.

Project Information: Documentation of the George Washington Memorial Parkway and Clara Barton Parkway was undertaken as a multi-year project by the Historic American Buildings Survey and the Historic American Engineering Record (HABS/HAER), a combined division of the National Park Service, Robert Kapsch, Chief. The project was sponsored by the Park Roads Program of the National Park Service, John Gingles, Deputy Chief, Engineering and Safety Services Division. The Project Supervisor was Sara Amy Leach, HABS Historian. Bridge reports were prepared by Elizabeth M. Nolin (1988); Michael P. Kucher (University of Delaware, 1993); and Jennifer P. Wentzien (University of Washington, 1994).

HABS Report No. VA-69 prepared by Timothy Davis (University of Texas) provides an overview history of the entire parkway project. Jack E. Boucher and Jet Lowe produced the large-format photographs. The Washington-based summer 1994 documentation team was headed by landscape architect Tim Mackey (Harvard University, Graduate School of Design).

II. HISTORY

The George Washington Memorial Parkway (GWMP) is comprised of three interconnected segments flanking the Potomac River in Virginia, Maryland and the District of Columbia. The first segment, completed in the centennial year of 1932 and known as the Mount Vernon Memorial Highway (MVMH), extends from the Arlington Memorial Bridge to Mount Vernon. The R. F. and P. Railroad Underpass is one of twelve original bridge structures located along the MVMH.

The Bureau of Public Roads (BPR) prepared plans and specifications for the MVMH. The office of Gilmore Clarke, consulting landscape architect, produced bridge elevations. The railroad furnished all material and labor in connection with detouring railroad traffic, but the Government was to reimburse the railroad directly for the work.¹

As with several other bridges along the parkway, early designs included provisions for a bridle path, which was eliminated in the final version. The final design provides an example of interplay between technical and aesthetic concerns, e.g., the specifications called for the girders to be "curved upward 2', 6", for appearance and to afford better clearance on the highway."² This research has not determined if the R.F. & P. Railroad Underpass was designed in steel to meet railroad code requirements or to gain clearance³. Regardless, it was technical and economic constraints rather than aesthetic preferences which led to the choice of an exposed steel structure. A unique aspect of the bridge is the use of silicon steel for structural members. Silicon steel has a yield strength approximately one-third greater than the more common carbon steel⁴.

Description

The underpass is a two-span, plate girder bridge resting on reinforced concrete abutments. Each span measures 55'-9" center to center. The total length is 119'-6 -3/4". The deck is 27' wide. Piers and abutments are skewed 15 degrees to the roadway and measure 33' between shoulders⁵.

The substructure is comprised of reinforced concrete footings resting on timber piles. Two 24" square reinforced concrete struts span between footings and resist the inward rotation of the abutments. Reinforced concrete abutments and a center pier are stone-faced. An oak-door accesses storage in the center pier. Each span is comprised of two longitudinal girders spaced at 27'. Plate girders are approximately 8' deep at supports and taper to 5'-7" at midspan. Girders are riveted on the inside of the panels and countersunk and chipped on the outside of the girders. Lateral floor beams are wide flange sections spaced at approximately 2'-6" on center. Steel is carbon structural steel except for silicon

¹U.S. Department of Agriculture, Bureau of Public Roads, "Mount Vernon Memorial Highway, Drawings for R.F. & P. Underpass," Contract Drawing G-531, 1932.

²Bureau of Public Roads, "Final Construction Report, Unit III, Bridges", 1932, p. 84.

³EDAW Inc., "Cultural Landscape Report," Vol.1, p.94. Suggests that it is railroad code requirements which specified steel.

⁴AASHTO, Standard Specifications for Highway Bridges, 7th edition, 1957, p. 34.

⁵"Mount Vernon Memorial Highway, Drawings for R.F. & P. Railroad Bridge," Contract Drawings, G-524, -526, G-529, 1932.

structural steel specified for girder flange material, webs and web splice material and floor beams. A ballasted concrete deck carries both communication lines and rails.⁶ The center pier and abutments are stone faced with dimensioned stone at corner quoins and copings. Stone masonry is a mixture of mica-schist and granite. Dimensioned stone is a light gray granite. Mica-schist was supplied by the Stoneyhurst Quarries, near Cabin John, MD. Granite was supplied by the Woodstock Granite Company.⁷ The design specified that the steel be painted charcoal grey, but it has since been repainted in a shade of green popular with the National Park Service.

The R.F. and P. Railroad Underpass was designed for the Coopers E-70 Loading for railroad traffic. The American Bridge Company of New York was employed to fabricate and install the structural steel. Materials testing was performed by the BPR Division of Tests with the exception of the structural steel which was arranged through the R.F. & P. Railroad Co. by the Robert W. Hunt Company of Pittsburgh, PA. Final costs as reported by J.V. McNary totaled \$175,360.74.⁸

⁶"Mount Vernon Memorial Highway, Drawings for R.F. & P. Railroad Bridge," Contract Drawing G-529, 1932.

⁷Bureau of Public Roads, "Final Construction Report, Unit III, Bridges," 1932, p. 14.

⁸*Ibid.*, p.6.

III. SOURCES

EDAW, Incorporated. "Cultural Landscape Report, Mount Vernon Memorial Highway. Volume 1: History; Appendix I: Specifications for Bridges." Prepared for the National Park Service, National Capital Region. Appendix I is a reprint of the 1930 document.

U.S. Department of Agriculture, Bureau of Public Roads. Construction Photographs of Mount Vernon Memorial Highway. 1930-32. Record Group 30-N, Boxes 241, 242. Still Pictures Division, National Archives and Records Administration, Archives II, College Park, Maryland.

U.S. Department of Agriculture, Bureau of Public Roads. "Bridges for Proposed Mount Vernon Memorial Highway," Contract Drawings. 1932.

Microfiche reductions of original drawings on file at the National Park Service, National Capital Region Park Headquarters, Washington D.C.

U.S. Department of Agriculture, Bureau of Public Roads, "Mount Vernon Memorial Highway Final Construction Report, Unit III, Bridges," 1932; report prepared by J.V. McNary; Box 1399; 420 General Virginia- 1926-1929; Bureau of Public Roads Classified Central File 1912-1959, Record Group 30; National Archives at College Park.

This bound but unpublished typescript includes an overview and a detailed account of the construction of each bridge. It also includes about sixty photographs of bridges both under construction and in their completed condition.

U.S. Department of Agriculture, Bureau of Public Roads, Record Group 30, Boxes 240-242, Archives II, College Park, Maryland, Still Pictures Division. Contains hundreds of photographs of the construction of the entire MVMH, including the bridges.

U.S. Department of the Interior, Historic American Buildings Survey (HABS), No. VA-69, "George Washington Memorial Parkway," 1994. Prints and Photographs Division, Library of Congress, Washington D.C.

Vertical file, "Parkways," at the Department of Transportation Library has many clippings from the Washington Star about the Mount Vernon Memorial Highway during the late 1920s and early 1930s.